

Shuck, Gary L.

Reply to Office Action of March 8, 2005

REMARKS/ARGUMENTS

Claims 1–30 are pending in the above-captioned application, and all of these claims stand rejected. With this paper, claims 1, 4–13, and 15–17 have been amended, and claims 2 and 2 have been canceled. No new matter was added with the amendment.

I. Claim rejections under 35 U.S.C. § 102(b) as being anticipated by Laugharn et al. (US 6120985)

Claims 1–3 and 9–24 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Laugharn et al. (US 6120985). This rejection is respectfully traversed. “[F]or anticipation under 35 U.S.C. § 102, a single reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present.” MPEP § 706.02. “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, USPQ2d 1913, 1920 (Fed. Cir. 1989).

With regard to amended independent claim 1, at a minimum, Laugharn et al. do not teach either applying a vacuum to a vacuum chamber or introducing a gas or fluid into the chamber while a microfluidic device placed in the chamber remains under vacuum. With regard to independent claim 18, at a minimum, Laugharn et al. do not teach placing one or more microfluidic devices in a vacuum chamber and applying a vacuum to the chamber. With regard to independent claim 23, at a minimum, Laugharn et al. do not teach a vacuum source configured to apply a vacuum to a chamber that is configured to receive a microfluidic device.

As described by Laugharn et al. in column 1, lines 50–53, their invention is “based on the discovery that hyperbaric, hydrostatic pressure reversibly alters the partitioning of biomolecules between certain adsorbed and solvated phases relative to partitioning at ambient pressure.” In carrying out the method of Laugharn et al., a sample is subjected to “high pressure” (i.e., hyperbaric pressure, commonly defined as a pressure higher than atmospheric pressure) to achieve “cell lysis and purification of biological materials.” *See* the abstract. The high pressure is exerted on the sample in a “pressure chamber.” *See* column 2, line 24. Nothing is introduced into the pressure chamber in the method of Laugharn et al. while the sample remains under pressure. The increased pressure alone accomplishes the desired result.

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This is quite different from Applicant's invention, which involves placing a microfluidic device in a chamber and applying a vacuum, i.e., a pressure lower than atmospheric pressure, to the chamber. A gas or liquid is then introduced into the vacuum chamber. Because the microfluidic device is submerged in the gas or liquid while the chamber remains under vacuum, venting the chamber (and with it the device) to a higher pressure, e.g., atmospheric pressure, causes the gas or liquid to flow into elements formed in the microfluidic device.

Further, Applicant's methods and systems accomplish filling of the microfluidic elements of a microfluidic device prior to introducing a sample into the device. *See* Applicant's specification page 5, line 24, through page 6, line 2. The methods and systems of Laugharn et al. are used after a sample has been introduced into a device in order to lyse cells in the sample for separation and/or purification of components of the cell. *See* the abstract.

Thus, Laugharn et al. do not teach every aspect of the claimed invention either explicitly or impliedly, nor do they show the identical invention claimed by Applicant in as complete detail as is contained in independent claims 1, 18, and 23. Withdrawal of the rejection of claims 1, 18, and 23 under U.S.C. § 102(b) as being anticipated by Laugharn et al. is, therefore, respectfully requested.

Claims 2, 3, and 9–17 depend directly or indirectly from independent claim 1, claims 19–22 depend directly or indirectly from independent claim 18, and claim 24 depends directly from claim 23. Therefore, Applicant respectfully submits that these dependent claims are allowable for at least the same reasons as set forth herein with respect to independent claims 1, 18, and 23. Withdrawal of the rejection of dependent claims 2, 3, 9–17, 19–22, and 24 under U.S.C. § 102(b) as being anticipated by Laugharn et al. is also respectfully requested.

Note that claim 1 has been amended to more particularly point out and distinctly claim Applicant's invention. Support for the added limitations can be found in original claims 2 and 3, which have been canceled with this amendment, as well as on page 15, line 30, through page 17, line 24, of the specification. Support for "filling" rather than "at least partially filling" a microfluidic element of a microfluidic device can be found throughout the specification and, as just one example, on page 10, lines 16–19, which describes using the methods and devices of the present invention to avoid bubble formation in microfluidic elements such as microchannels.

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Claims 4–8 have been amended to depend from claim 1 rather than from the canceled claim 3. Claims 9, 11, 15, and 17 have been amended to better echo the phrasing of claim 1. Claims 10 and 16 have been amended to correct improper Markush group language. The terms “microfluidic channel” and “microchannel” (in claim 15) have been replaced with the term “microfluidic element.” This term is used throughout the specification and is defined on, for example, page 8 in lines 5 and 30. No new matter has been added by any of the amendments.

II. Claim rejections under 35 U.S.C. § 103(a) as being unpatentable over Laugharn et al. (US 6120985)

Claims 4–8 and 25–30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Laugharn et al. (US 6120985). The rejection of these claims is respectfully traversed.

To warrant rejection under 35 U.S.C. § 103(a), all the claim limitations must be taught or suggested by the prior art. *See* MPEP § 2142. As has been demonstrated above, the Laugharn et al. reference neither teaches nor suggests all of the limitations of Applicant’s amended claim 1. Thus, claim 1 is nonobvious. Claims 4–8 depend directly from amended claim 1. Any claim depending from a nonobvious claim is also nonobvious. *See* MPEP § 2143.03 and *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, dependent claims 4–8 are nonobvious. Withdrawal of the rejection of these claims as being unpatentable over Laugharn et al. is therefore respectfully requested.

As has also been demonstrated above, the Laugharn et al. reference neither teaches nor suggests all of the limitations of Applicant’s independent claim 23. Therefore, claim 23 is nonobvious. Claims 25–30 depend either directly or indirectly from claim 23. As any claim depending from a nonobvious claim is also nonobvious, dependent claims 25–30 are nonobvious. Withdrawal of the rejection of claims 25–30 as being unpatentable over Laugharn et al. is therefore respectfully requested.

Conclusion

For the foregoing reasons, Applicant believes all the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone

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conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned attorney.

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Signed:

